

AMA GuidesTM Newsletter

Expert advice, practical information, and current trends on impairment evaluation

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The *Guides Newsletter* provides updates, authoritative guidance, and AMA interpretations and rationales for the use of the *AMA Guides to the Evaluation of Permanent Impairment*.



Comparative Analysis of AMA Guides Ratings by the Fourth, Fifth, and Sixth Editions*

By Christopher R. Brigham, MD, Craig Uejo, MD, MPH, Aimee McEntire, and Leslie Dilbeck

Background

The *AMA Guides to the Evaluation of Permanent Impairment (Guides)* is the recognized standard for quantifying the medical loss associated with an injury or illness. In December 2007, the American Medical Association published the most recent edition, the Sixth Edition.¹ The Fourth Edition² was published in 1993 and the Fifth Edition³ in 2000. As with other areas of medicine, concepts and approaches are improved with time; for example, in medicine, some treatments are found to be ineffective and are dropped from practice and new approaches are adopted. This also occurs with the medical assessment of impairment. With the change in impairment methodology, there will also be changes in impairment values associated with specific conditions. As clinical medicine evolves and there is increased efficacy of treatment, it is hoped that improved outcomes will reduce impairment previously associated with injury and illness.

The Sixth Edition introduces a new approach to rating impairment. An innovative methodology is used to enhance the relevance of impairment ratings, improve internal consistency, promote greater precision, and simplify the rating process. The approach is based on an adaptation of the conceptual framework of the International Classification of Functioning, Disability, and Health,⁴ although many of the fundamental principles underlying the *Guides* remain unchanged.

There have been challenges associated with the use of the *Guides*, including criticisms of the *Guides* itself.⁵⁻¹² Previous criticisms include the following:

- The method fails to provide a comprehensive, valid, reliable, unbiased, and evidence-based rating system.
- Impairment ratings do not adequately or accurately reflect loss of function.
- Numerical ratings are more the representation of “legal fiction than medical reality.”

In response to these criticisms, the following changes were recommended with the Sixth Edition:

- Standardize assessment of activities of daily living limitations associated with physical impairments.
- Apply functional assessment tools to validate impairment rating scales.
- Include measures of functional loss in the impairment rating.
- Improve overall intrarater and interrater reliability and internal consistency.

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Some changes in the Sixth Edition have impacted impairment ratings. For example, impairment ratings are now included for conditions that may result in functional loss, but previously did not result in ratable impairment (such as nonspecific spinal pain and certain soft-tissue conditions). Additional impairment is typically not provided for surgical interventions, reflecting an underlying concept that treatment is designed to improve function and decrease impairment, with a focus on final outcome. Impairments associated with some diagnoses (eg, total knee replacements, carpal tunnel release, and cervical spine fusion) were revised to more accurately reflect treatment outcomes.

The Sixth Edition states in Chapter 2, Practical Applications of the *Guides* "There is increased use of the *Guides* to translate objective clinical findings into a percentage of the whole person. Typically this number is used to measure the residual deficit, a loss—a number that is then converted to a monetary award to the injured party" (6th ed, 20). In that the *Guides* is used by many workers' compensation systems to define permanent disability awards, it is appropriate to determine whether changes in editions result in different impairment ratings and different permanent disability awards.

Study

To determine the impact of changes in editions, a study was performed to determine the impairment ratings resulting from use the Fourth, Fifth, and Sixth Editions for various conditions. Two hundred cases were assessed, and the clinical data were used to determine the resulting whole person permanent impairment according to each of these 3 editions. If the case reflected more than 1 diagnosis, each diagnosis was rated, and if both extremities were involved (eg, a bilateral carpal tunnel syndrome), each was rated as a separate diagnosis since each would be associated with a separate impairment. The cases analyzed were referred by 3 clients who refer all impairment ratings to determine their accuracy (2 based in California and 1 in Hawaii) in 2009 to Impairment Resources, LLC. It is probable that these cases reflect typical cases resulting in impairment rating, since the cases were not selectively referred, ie, the referring client did not refer the case because it was atypical or there was a concern about the rating.

Sixty-seven percent of the cases (134 cases) were from California, 28.5% (57 cases) were from Hawaii, and 4.5% (9 cases) were from Nevada. All cases had been originally rated by the Fifth Edition. Each case was independently analyzed by a professional rater experienced in the use of the Fourth, Fifth, and Sixth Editions, using the clinical data provided. Fourteen cases were excluded because the information was insufficient to permit a rating by the three editions, and these cases were replaced to provide a total sample of 200 cases. To ensure reliability, 15% (30) of these cases were blindly reviewed by an independent reviewer; all 30 ratings had interrater agreement within 1% whole person permanent impairment with the exception of one. In that case, there was a 5-percentage point difference between raters in whole person permanent impairment for the Fifth Edition rating because of differing interpretations of the appropriate spinal impairment (using the diagnosis-related estimates approach). There was agreement within 1% whole person permanent impairment for all Sixth Edition ratings.

Results

Two hundred seventy-nine diagnoses were associated with these cases; 48 of the cases had more than one ratable diagnosis. Forty-one percent of these diagnoses (114) involved surgery. The average age of the patients was 45.2 years (range, 22-79 years), and the majority were male (65%). The average time between the date of injury and date of the original impairment evaluation was 23 months (range, 3 months to 12 years).

Seventy-three percent of the Sixth Edition ratings (204 of 279) were based on the diagnosis-based impairment (DBI) approach (including entrapment), 22% of the ratings were based on range of motion (35% of the extremity cases), and 5% involved other approaches. Of the DBI ratings, most (81%) were class 1 (mild problem), with 6% class 0

Comparative Analysis (continued)

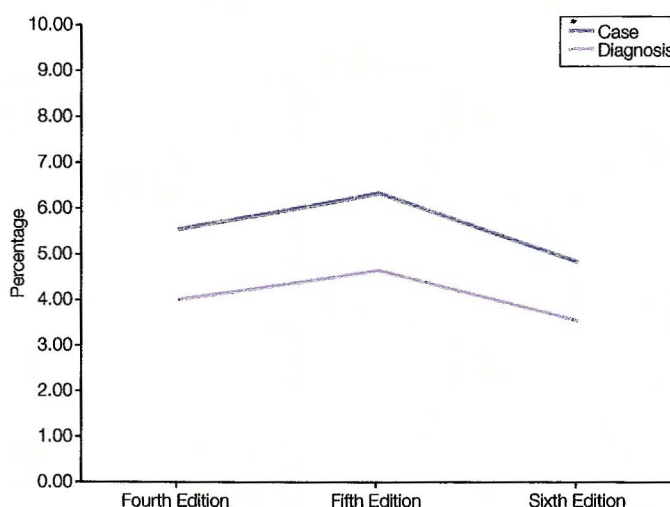
(no problem), 8% class 2 (moderate problem), 5% class 3 (severe problem) and 0% class 4 (very severe problem). The average ratable class was 1.2, with average grade modifiers for functional history adjustment of 1.2; physical examination adjustment, 0.6; and clinical studies, 0.8. Grade A was the most common assignment (34% of the time), followed by grade B (28%), grade C (21%), grade D (21%), and grade E (6%).

The average whole person permanent impairment (WPI) per case was 4.82% WPI per the Sixth Edition, 6.33% WPI per the Fifth Edition, and 5.5% WPI per the Fourth Edition. The overall average whole person permanent impairment for each diagnosis was 3.53% WPI per the Sixth Edition, 4.59% WPI per the Fifth Edition, and 4.00% WPI per the Fourth Edition. This is reflected in Figure 1. The difference between average whole person impairment ratings was tested using a paired sample t-test analysis, with an alpha level set at the .05 level of significance. This analysis revealed a statistically significant difference between average whole person impairment ratings when comparing the Sixth Edition with the Fifth Edition, but not when comparing the Sixth Edition results with those of the Fourth Edition.

With the Sixth Edition there were meaningful changes in impairment ratings as a result of not providing additional impairment for surgical (therapeutic) spine procedures, improved outcomes with surgical release for carpal tunnel syndrome, and improved outcomes with total knee and hip replacement. Excluding the cases that were not impacted by these changes, the overall average whole person permanent impairment for each diagnosis was 3.40% WPI per the Sixth Edition, 3.61% WPI per the Fifth Edition, and 3.16% WPI per the Fourth Edition.

Upper extremity impairments were most common, reflecting 45% of the ratable diagnoses, as shown in Table 1.

Figure 1. Comparison of Average Whole Person Permanent Impairment Ratings by Edition



The average WPI ratings for cases and diagnoses are given in Figure 2.

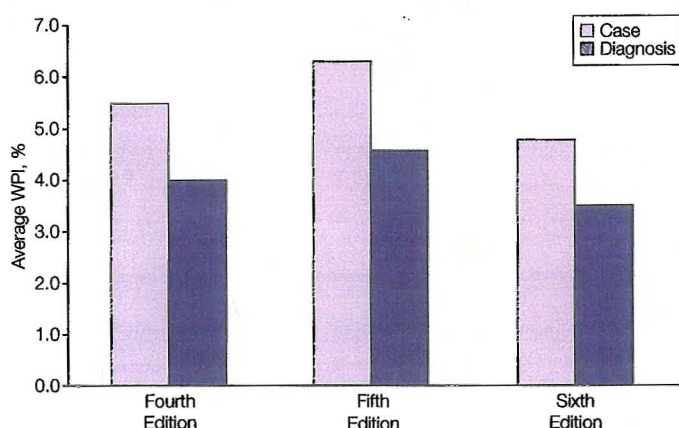
The difference between impairment ratings for diagnoses, grouped as nonsurgical and surgical, was tested using a paired sample t-test analysis, with an alpha level set at the .05 level of significance. There was no meaningful difference in the rating values seen for the 165 nonsurgical diagnoses with the Sixth Edition compared with the Fourth Edition (both averaging 2.9% WPI) nor with the Fifth Edition (averaging 3.2% WPI). The most meaningful differences were observed with surgical diagnoses, with the Sixth Edition averaging 4.5% WPI, the Fifth Edition 6.6% WPI, and the Fourth Edition 5.6% WPI. This analysis revealed a statistically significant difference between impairment ratings for surgical diagnoses

Table 1. Comparison of Average Whole Person Permanent Impairment Ratings by Sixth Edition Chapters

| Chapter | Title | WPI, % | | | No. (%) of Diagnoses |
|---------|---|----------------|---------------|---------------|----------------------|
| | | Fourth Edition | Fifth Edition | Sixth Edition | |
| 6 | The Digestive System | 2.0 | 2.0 | 3.0 | 1 (0.4) |
| 5 | The Pulmonary System | 25.0 | 25.0 | 24.0 | 1 (0.4) |
| 7 | The Urinary and Reproductive Systems | 5.0 | 5.0 | 5.0 | 1 (0.4) |
| 12 | The Visual System | 5.0 | 5.0 | 5.0 | 1 (0.4) |
| 4 | The Cardiovascular System | 4.0 | 4.0 | 3.0 | 2 (0.7) |
| 11 | Ear, Nose, Throat, and Related Structures | 1.5 | 1.5 | 1.5 | 2 (0.7) |
| 8 | The Skin | 1.0 | 1.0 | 1.0 | 2 (0.7) |
| 16 | The Lower Extremities | 4.0 | 4.0 | 3.2 | 57 (20.4) |
| 17 | The Spine and Pelvis | 5.2 | 6.7 | 4.1 | 86 (30.8) |
| 15 | The Upper Extremities | 3.1 | 3.4 | 3.2 | 126 (45.2) |
| | Total | | | | 279 (100.0) |

Comparative Analysis (continued)

Figure 2. Comparison of Average Whole Person Permanent Impairment Ratings by Edition



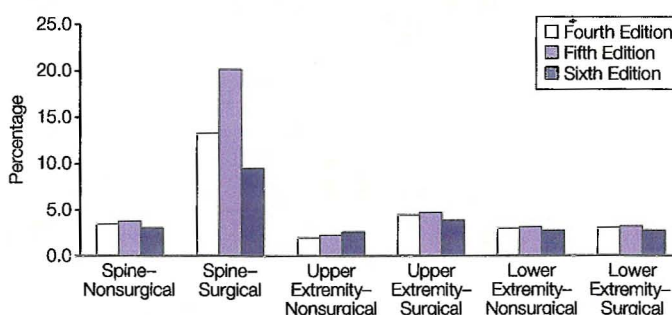
when comparing the Sixth Edition with the Fifth Edition, but not when comparing the Sixth Edition results with those of the Fourth Edition. This finding was expected, given that the Sixth Edition typically does not give additional impairment for surgical (therapeutic) interventions. The most meaningful change in impairment values was for spine-related diagnoses, particularly those that resulted in surgery; the results for musculoskeletal impairments are given in Table 2 and Figure 3.

Twenty-one percent (58) of the 279 diagnosis-based ratings resulted in no ratable impairment per the Fifth Edition; however, of these 0 ratings, 41 (71%) had ratable impairment by the Sixth Edition, with the average impairment

Table 2. Comparison of Average Whole Person Permanent Impairment Musculoskeletal Ratings by Category, Nonsurgical vs Surgical Intervention, and Edition

| Category | No. | WPI, % | | |
|--------------------|-----|----------------|---------------|---------------|
| | | Fourth Edition | Fifth Edition | Sixth Edition |
| All | | | | |
| Spine | 86 | 5.2% | 6.7% | 4.1% |
| Upper extremity | 126 | 3.1% | 3.4% | 3.2% |
| Lower extremity | 57 | 4.0% | 4.0% | 3.2% |
| Nonsurgical | | | | |
| Spine | 71 | 3.5% | 3.8% | 3.0% |
| Upper extremity | 66 | 2.0% | 2.2% | 2.6% |
| Lower extremity | 20 | 3.0% | 3.2% | 2.7% |
| Surgical | | | | |
| Spine | 15 | 13.3% | 20.1% | 9.5% |
| Upper extremity | 60 | 4.4% | 4.7% | 3.8% |
| Lower extremity | 37 | 4.6% | 4.5% | 3.4% |

Figure 3. Comparison of Average Whole Person Permanent Impairment Ratings by Category, Nonsurgical vs Surgical Intervention, and Edition



being 1% WPI (66% of these cases involved nonspecific ment by the Sixth Edition, with the average impairment spinal pain and most of the other cases involved soft-tissue injury). Twenty-seven percent (76) of the ratings that resulted in no ratable impairment by the Fourth Edition resulted in an average of 1% WPI when rated with the Sixth Edition.

In analyzing impairments categorized by the value obtained by rating with the Fourth and Fifth Editions, the most meaningful differences were seen with higher-rated impairments. Of the Fifth Edition ratings, 68% (189 diagnoses) were within the range of 1% to 9% WPI. For these cases, the average rating by the Sixth Edition was 3.2% WPI, the Fifth Edition 3.8% WPI, and the Fourth Edition 3.4% WPI. For impairments of 10% WPI and greater by the Fifth Edition, the average rating by the Sixth Edition was 10.2% WPI, the Fifth Edition 16.8% WPI, and the Fourth Edition 14.1% WPI.

Figure 4. Comparison of Average Whole Person Permanent Impairment Ratings Based on Fourth Edition Rating Categorization

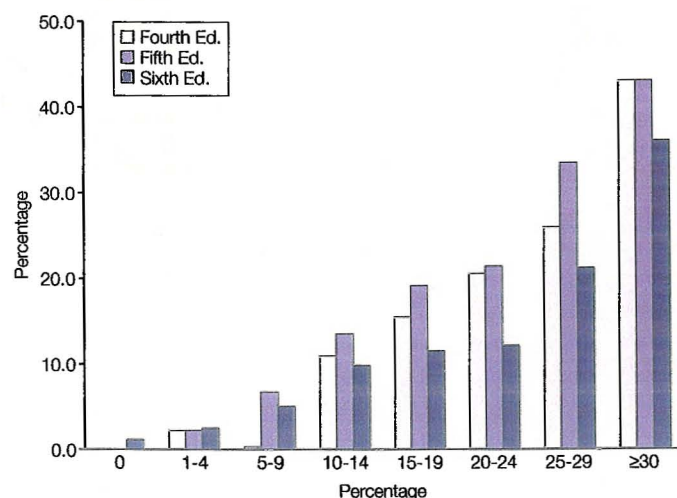
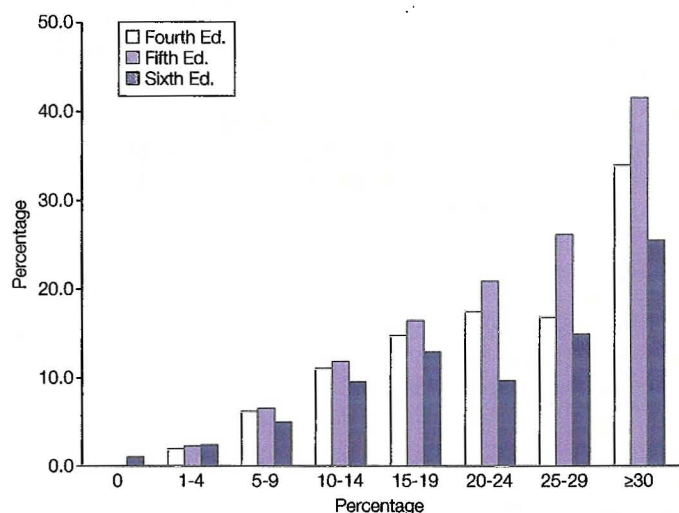


Figure 5. Comparison of Average Whole Person Permanent Impairment Ratings Based on Fifth Edition Rating Categorization



The relative changes in impairment values per case based on categorization by the Fourth and Fifth Edition ratings are illustrated in Figures 4 and 5.

In analyzing the differences for musculoskeletal disorders, the most meaningful changes were for the spine, as reflected in Table 3. There was slight increase in ratings for the shoulder, wrist, and ankle/foot. (Table 3 includes only regions where there were 5 or more ratable diagnoses.) The differences for musculoskeletal regions are illustrated in Figures 6, 7, and 8.

The most common diagnosis (based on assignment by International Classification of Diseases, Ninth Revision [ICD-9]) was shoulder region disease not elsewhere classified (NEC) (726.2), followed by backache not otherwise specified (NOS) (847.2) and carpal tunnel syndrome (354). The impairment values associated with these diagnoses are shown in Table 4.

Summary

There is a statistically significant difference between average whole person impairment ratings when comparing the Sixth Edition with the Fifth Edition, but not when comparing the Sixth Edition results with those of the Fourth Edition. Average values had increased from the Fourth Edition to the Fifth Edition, yet without clear scientific rationale. The average impairment rating in this sample of cases, per the Sixth Edition, was 4.82% WPI, with an average impairment rating per diagnosis of 3.53% WPI. The impact for a patient based on his or her actual diagnostic impairment is small, with a greater difference seen for the Fifth Edition (4.59% WPI, a 1.06-percentage point WPI decrease) than the Fourth Edition (4.00%, a

Figure 6. WPI Comparison for Upper Extremity Diagnoses

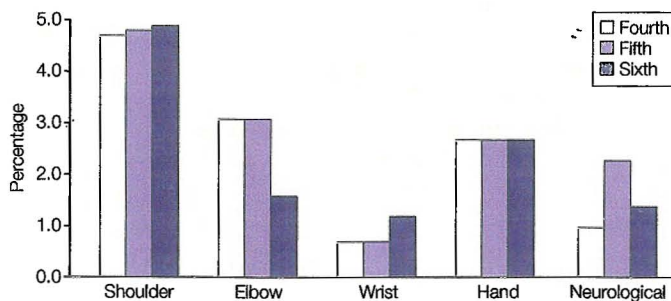


Figure 7. WPI Comparison for Lower Extremity Diagnoses

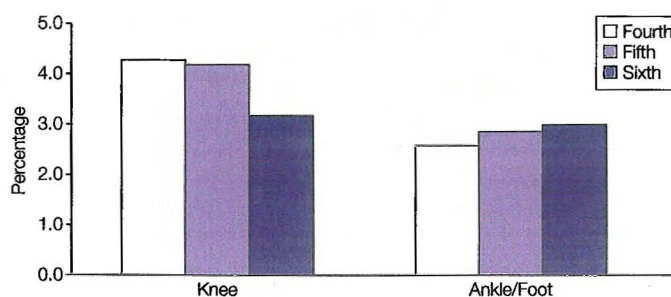
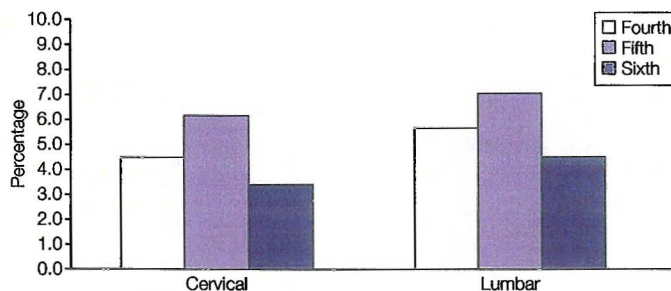


Figure 8. WPI Comparison for Spine Diagnoses



0.47-percentage point WPI decrease). Many of the more meaningful changes were for spine-related diagnoses that resulted in surgery, reflecting the Sixth Edition approach, which bases impairment ratings on the condition and outcome rather than therapeutic interventions including surgery. However, with the Sixth Edition, a substantial percentage of cases that were rated as zero impairment in previous editions will have some ratable impairment.

The observed modest changes in values with the Sixth Edition were expected and primarily due to the recognition that (1) surgery and all therapeutic endeavors should improve function and therefore should not routinely increase impairment, (2) there are improved functional outcomes for

Comparative Analysis (continued)

Table 3. Comparison of Average Whole Person Permanent Impairment Ratings by Region and Edition

| Problem | No. of Diagnoses | WPI, % | | | Difference, Sixth vs Fifth Edition, Percentage Points |
|------------------------------|------------------|----------------|---------------|---------------|---|
| | | Fourth Edition | Fifth Edition | Sixth Edition | |
| Upper extremity-shoulder | 48 | 4.7 | 4.8 | 4.9 | +0.1 |
| Upper extremity-elbow | 7 | 3.1 | 3.1 | 1.6 | -1.5 |
| Upper extremity-wrist | 6 | 0.7 | 0.7 | 1.2 | +0.5 |
| Upper extremity-hand | 30 | 2.7 | 2.7 | 2.7 | 0 |
| Upper extremity-neurological | 26 | 1.0 | 2.3 | 1.4 | -0.9 |
| Lower extremity-knee | 31 | 4.3 | 4.2 | 3.2 | -1.0 |
| Lower extremity-ankle/foot | 13 | 2.6 | 2.9 | 3.0 | +0.1 |
| Spine-cervical | 33 | 4.5 | 6.2 | 3.4 | -2.8 |
| Spine-lumbar | 50 | 5.7 | 7.1 | 4.5 | -2.6 |

Table 4. Comparison of Whole Person Permanent Impairment Ratings for Common Diagnoses

| Diagnosis | ICD-9 Code | WPI, % | | | No. (%) of Diagnoses |
|---------------------------------|------------|----------------|---------------|---------------|----------------------|
| | | Fourth Edition | Fifth Edition | Sixth Edition | |
| Shoulder region NOS | 726.2 | 4.6 | 4.6 | 4.8 | 36 (12.9) |
| Backache NOS | 724.5 | 2.9 | 3.6 | 2.0 | 29 (10.4) |
| Carpal tunnel syndrome | 354.0 | 0.9 | 2.4 | 1.3 | 22 (7.9) |
| Derangement meniscus NEC | 717.5 | 2.1 | 2.1 | 1.8 | 18 (6.5) |
| Cervicalgia | 723.1 | 0.9 | 1.1 | 0.7 | 17 (6.1) |
| Disc disease NEC/NOS-lumbar | 722.93 | 9.4 | 11.3 | 7.6 | 16 (5.7) |
| Sprain of hand NOS | 842.10 | 1.8 | 1.8 | 1.8 | 13 (4.7) |
| Disc disease NEC/NOS-cervical | 722.91 | 7.1 | 9.3 | 5.8 | 12 (4.3) |
| Osteoarthritis, Unspecified-leg | 715.96 | 4.9 | 4.9 | 3.6 | 7 (2.5) |
| Rotator cuff syndrome NOS | 726.10 | 7.8 | 7.8 | 6.7 | 6 (2.2) |
| Sprain of ankle NOS | 845.00 | 1.8 | 2.5 | 2.3 | 6 (2.2) |
| Finger injury NOS | 959.5 | 2.0 | 2.2 | 1.8 | 6 (2.2) |
| Internal derangement knee NOS | 717.9 | 3.2 | 3.2 | 3.0 | 5 (1.8) |
| Fracture ankle NOS-closed | 824.8 | 3.8 | 3.8 | 4.0 | 5 (1.8) |
| Trigger finger | 727.03 | 2.5 | 2.5 | 2.0 | 4 (1.4) |
| Fracture forearm NOS-closed | 813.80 | 5.8 | 5.8 | 4.8 | 4 (1.4) |
| Sprain elbow/forearm NOS | 841.9 | 1.5 | 1.5 | 1.0 | 4 (1.4) |
| Ulnar nerve lesion | 354.2 | 2.0 | 2.0 | 2.0 | 3 (1.1) |
| Biceps tendon rupture | 727.62 | 1.3 | 2.0 | 2.3 | 3 (1.1) |
| Fracture lumbar vertebra | 805.4 | 10.0 | 12.3 | 9.7 | 3 (1.1) |
| Joint replaced knee | V43.65 | 20.0 | 20.0 | 13.3 | 3 (1.1) |

carpal tunnel syndrome and total joint replacement, and (3) certain common conditions that resulted in functional deficits but no ratable impairment in previous editions should be ratable. Excellent interrater reliability with Sixth Edition ratings was demonstrated; this is consistent with one of the goals of the Sixth Edition, to improve the validity and reliability of impairment ratings.

Acknowledgments

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Guides Question and Answer

Question: In the absence of a compensable hearing loss, can impairment be assigned for tinnitus? Our state makes use of the Fourth Edition, however I am also interested in how this is dealt with in other editions.

Answer: The AMA *Guides* hearing impairment section has changed little from the First to the Sixth Edition.

In the first 2 editions of the *Guides*, tinnitus is not discussed.

In the Third Edition, pages 165-166, it states that tinnitus is a symptom and is not measurable, and thus impairment should be based on tinnitus severity, and the rating should be consistent with other established values (meaning a rating of similar magnitude to other conditions that have established ratings).

In the Fourth Edition, page 224, left column, paragraph 2 it says that tinnitus may impair speech discrimination and thus a rating of up to 5% may be added to the rating for hearing loss. Problems with this section are that it does not state whether the "up to 5%" is monaural impairment, binaural impairment, or whole person impairment (WPI); and it does not specifically say what to do if hearing is normal (ie, can you add 5% for tinnitus to 0% for hearing impairment?). Organizations that teach the *Guides* have traditionally taught that the key is the speech discrimination score on the

audiogram report. If speech discrimination is about what's expected by the decibels of loss on the audiogram, there is no additional tinnitus impairment, but, if the speech discrimination score is worse than expected based on the audiogram, then the examiner may use the 1%, 2%, 3%, 4%, or 5% increase in the binaural impairment, but this is not explicitly stated in the Fourth Edition.

The Fifth Edition (page 246, right column, last paragraph) adds the comment that the "up to 5%" rating can be added, but only added to the "measurable hearing impairment," finally clarifying that there must be measurable hearing loss (an impairment) before the tinnitus could be rated.

The Sixth Edition (page 249) adds multiple paragraphs and devotes an entire section to tinnitus (section 11b). This adds the clarification that the "up to 5%" is binaural impairment.

Thus the questions left unanswered in the Fourth Edition are finally clarified in the Fifth and Sixth Editions. Because the methodology and the numbers ("up to 5%") have not changed, the clarifications from the later editions should logically guide those who administratively must use the Fourth Edition.

James B. Talmage MD